

# Knowledge Generation Process: A Measurement Approach

G Suri Babu<sup>a</sup>, Dr. Salma Ahmed<sup>b</sup>, Yasser Mahfooz<sup>c</sup>, Dr. Gupta K S<sup>d</sup>

<sup>a</sup>Scientist "E",  
Gas Turbine Research Establishment (GTRE),  
Defence Research and Development Organization (DRDO),  
Ministry of Defence, Govt. of India, Bangalore, India.  
[gsbabumail@yahoo.com](mailto:gsbabumail@yahoo.com)

<sup>b</sup>Reader,  
Faculty of Management Studies & Research,  
Department of Business Administration,  
Aligarh Muslim University, Aligarh, India  
Tel: +91-9897355705  
[salmaahmed6@rediffmail.com](mailto:salmaahmed6@rediffmail.com)

<sup>c</sup>Lecturer,  
Faculty of Management Studies & Research,  
Department of Business Administration,  
Aligarh Muslim University, Aligarh, India.  
Tel: +91-9358212399  
[yassermahfooz@rediffmail.com](mailto:yassermahfooz@rediffmail.com)

<sup>d</sup>Associate DEAN,  
ICFAI BusinessSchool,  
Bangalore, India.

## ABSTRACT

*The key objective of this research paper is to develop an understanding on the knowledge generation aspect through process development and attempted for its measurement in the context of knowledge management in high performance organizations. A survey is carried out at all the levels of the managers in a high performance organization to measure the knowledge generation efforts that can contribute to estimate the outcome dimensions as competitive advantage. The results indicate that the measurement of knowledge generation can be attempted with antecedents and outcomes of the knowledge generation process. The correlation analysis indicates a positive association among the variables. The regression model is developed to know the awareness about the dependency and linearity between the Knowledge Generation and Outcome dimensions. Finally, some efforts are made in this research work to achieve more clarity through measurement on the knowledge generation process that can contribute to knowledge management area of the management science.*

## Keywords

*Knowledge Management (KM), Knowledge Generation (KG), Knowledge Intensive Business Services (KIBS).*

## 1.0 INTRODUCTION

Knowledge is became the subject of philosophical and epistemological studies since the centuries. The knowledge is generated in the minds of the people and new knowledge is created in the minds of the people (Nonaka, 1991). Knowledge is identified as a critical resource of the organizations and knowledge management is crucial to achieve competitive advantage (Nonaka and Takeuchi, 1995; Stewart, 2000). But the knowledge management begins with knowledge generation and new knowledge creation within the organizations

Therefore, the knowledge is generated in the each and every employee in the organization thinking, innovation, rethinking, research, experience, skills and expertise. This generated knowledge is transformed into the tasks and activities instantaneously by the employees to achieve the organizational success. This success is measured only through the profits and growth of the organizations. But, the knowledge generated may exists in the form of competitive advantage, and embed in the form of culture, structure, processes, procedures and minds of the people.

Hence, there is a basic need to attempt for the measurement of knowledge generation aspects in the organizations as a measurement of competitive advantage. In the view of increasing competition in the era of Globalization, Privatization and Liberalization, organization are seeking various ways to convert the individual skills, expertise, and experience to the

organizational knowledge. It is ability of the high performance organizations to create enabling environment to effectively leverage the knowledge of their employees to achieve success. Most of this generated knowledge by the people is shaped by the culture, where culture and knowledge are inextricably linked in the minds of the employees as a soft skill.

Knowledge Management is already identified as one of the most important resource that can contribute to the competitive advantage of any organization. Knowledge Generation and Knowledge Sharing are two major processes that can contribute to the Knowledge Management, and Knowledge Generation is most crucial part that is critical to Knowledge Management (Chatzkel, 2004; Dvir and Pasher, 2004; Ergazakis et al., 2006; Martinez, 2006). Learning Organization is an organization that is continually expanding its capability to create its future (Senge, 1990). A learning organization is an organization skilled at knowledge generation and knowledge sharing, and modifying its behavior to reflect on new knowledge and insights (Garvin, 1993). The knowledge management can be viewed from many dimensions. But, in the view of learning organizations, the knowledge management essentially needs the knowledge generation and knowledge sharing processes. Therefore, the knowledge management is became as very important component of a leaning organization that requires knowledge generation and knowledge sharing processes to disseminate the knowledge among all the work force to achieve the improved organizational performance.

The most important difficulty facing by organizations and researchers is that the knowledge management is intuitively important and is intellectually elusive (Despres and Chauvel, 1999). The importance of knowledge management is already identified, because with rare exceptions, the productivity of a modern corporation or nation lies more in its intellectual and system capabilities than in its hard assets (Quinn et al., 1996). The knowledge management success became elusive, sometimes, because the knowledge generation part became the most abstractive, and very difficult to measure. And knowledge management becomes everything and nothing (Alvesson and Willmott, 1996). This is because of lack of measurement efforts in the area of knowledge generation which is a critical part of knowledge management.

Knowledge management involves a mix of cultural, organizational, process, management, and technology initiatives. In addition, the knowledge generation process is required to be designed and attempted for the measurement, for the leverage of the existing knowledge. The complexity of the human mind thinking process, and its understanding through knowledge management requires the development of knowledge generation process that can have the measurement approach.

The economy of any organization is a mixture of exogenous constraints, such as quality of organizational processes and accumulation of the powerful human resource. These are the intangibles. It is the ability of the organization to develop and foster these intangibles as trust, and converted into the competitive pool to nurture and support the value chains and to develop the collaborative learning and technological entrepreneurial culture that can provide momentum to the competitive advantage. This competitive edge is absolutely the organization-specific, and thus difficult to reproduce by the competitor in the global business environment. Once organizations achieve or going to achieve this competitive advantage, it is better to attempt for its measurement, so as to enable to plan for the long term competitive advantage and sustainability.

## 2.0 KNOWLEDGE GENERATION

Knowledge Generation is a complex and instantaneous human process that happens in the minds of people, and this knowledge is shared automatically by the employees in the high performance organizations due to the enabling nature and culture of knowledge management environment. Many organizations have already identified the importance of knowledge generation process for the success of the knowledge management to leverage their core competencies, but lacking in the measurement efforts to estimate for the competitive advantage. Unfortunately, very little is known about the measurement aspects of knowledge generation part in the management science. In India, the economies are dominated by the products and services of public sector undertakings. It is due to the dependence on high level of knowledge management and innovation. It is true even in other parts of the world also. The OECD estimates between the years 1970 and 1995 about half of the total growth in output of developed world resulted from innovation, and the proportion is increasing, as the economy becomes more of high level of knowledge intensive (OECD, 2000). The innovative capacity is the key to productivity, and competitiveness can be equated with productivity (Porter, 1990). In the context of globalization, first world economies need to concentrate on high value additions on their products and services, and to be innovative and knowledge intensive to achieve competitive advantage (Porter, 2003).

Innovation is an attempt to create competitive advantage by perceiving or discovering a new and better ways of competition in the industry, and bringing them to marker (Porter, 1990). More broadly, this concept can be defined as the introduction of new products, new process, and new services into the market by the learning organization to achieve competitive advantage. More specifically, the measurement aspects in the knowledge generation process became challenging to the organizations due to knowledge intensiveness or Knowledge Intensive Business Services (KIBS) in these new products, new processes and new services. In addition, it is to be noted

that the knowledge management not just a technological and economic process. It is a more complex human thinking process that consists of knowledge generation and knowledge sharing, in addition to social, political and geographic processes. Therefore, the competitive advantage is highly dependent on the knowledge generation, and ways in which individuals and groups that generate and share the knowledge for the success of their organization (Scott and Storper, 2003; Bilderbeek and den Hertog, 2000; Miles et al., 1996; Suri Babu, et al., 2008). Knowledge is generated and resides in the minds of the people. But, in the high performance organizations, this generated knowledge is automatically shared and utilized by the people not only to achieve competitive advantage but also for the success (Suri Babu et. al., 2007). This Knowledge Generation is already identified as a key resource that can contribute to the success of the organization as a core competence, hence attempted for the process development and measurement aspects to predict the competitive advantage.

### 3.0 DEVELOPMENT OF KNOWLEDGE GENERATION PROCESS MODEL FOR THE MEASUREMENT

The knowledge generation process model is developed with the basic input-process-output model with feed back. The basic aim is to measure the knowledge generation process variable with antecedents and outcome dimensions. The knowledge generation process model is developed with four antecedents viz. competing, Deciding, Learning and Connecting, and with three outcome dimensions, viz. Efficacy, Satisfaction and Involvement. The process model is as in the figure – 1 below:

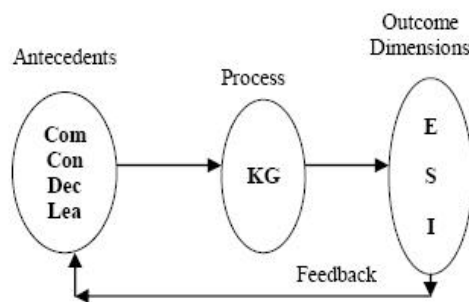


Figure 1: Measurement Process

Abbreviation and its expansions shown in above figure - 1 are given at Table - 1 below:

Table 1: Abbreviations used in the process model.

Antecedents	Process	Outcome (OC)
Competing (Com)	Knowledge	Efficacy (E)
Connecting (Con)	Generation	Satisfaction (S)
Deciding (Dec)	(KG)	Involvement (I)
Learning (Lea)		

## 4.0 METHODOLOGY

This research work is planned to carryout with the following sub tasks:

- ✍ Formulation of Research Question
- ✍ Formulation Hypothesis
- ✍ Development of Inventory
- ✍ Data Collection and sample size
  - Reliability
- ✍ Analysis and discussions on results
  - Descriptive Statistics
  - Correlation Analysis
  - Regression Analysis
- ✍ Conclusions
- ✍ Limitations

### 4.1 Research Question

Is there any relationship between the KnowledgeGeneration and Outcome dimensions.

### 4.2 Hypothesis

The following two hypotheses are formulated for testing:

#### 4.2.1 Hypothesis-1

**H10:** There is no significant correlation relationshipbetween process variable (KG) and its antecedents.

**H11:** There is significant correlation relationship between process variable (KG) and its antecedents.

#### 4.2.2 Hypothesis-2

**H20:** There is no significant correlation relationship between overall Outcome (OC) and its dimensions.

**H21:** There is a significant correlation relationship between overall Outcome (OC) and its dimensions.

### 4.3 Inventory

A questionnaire is developed for this research work as there is no direct measuring instrument is available in the literature. The questionnaire is designed in two parts. The part-I of the questionnaire is consisting of the personal information of respondent. The demographic variable are: Name, Age, Experience, Gender, Manager Level, and Function Working Group. The part-II of the questionnaire is consisting of twenty one hypothetical questions that can measure their perception on the knowledge generation concept by the all the levels managers in the organization.

All these question items are rated by using a five point item-wise Likert like scale with anchors labeled as 1 = never, 2 = sometimes, 3 = moderately often, 4 = often, 5

= very often. Many efforts were made to capture the perception of the employees to that can measure the effectiveness of knowledge generation in the organizations.

#### 4.4 Data Collection & Sample size

The questionnaire is administered to 125 manager level employees of a high performance organization through personal interviews, conducting interviews, seminars and workshops, and received 103 responses. Out of this 103, only 87 responses are selected for the analysis purposes, because these 87 responses are completely filled without any ambiguity. The other 16 responses are rejected due to non-completion and ambiguity in the responses.

##### 4.4.1 Reliability

The reliability analysis is carried out to find the reliability of the questionnaire of twenty one question items and sample size of  $N = 87$ . The Cronbach Alpha value found is **0.8471**. This is value show the high reliability of the questionnaire and data collection procedure.

## 5.0 ANALYSIS AND DISCUSSIONS ON RESULTS

The data is analyzed with the help of Microsoft Excel Spread sheets and SPSS Windows version 6.3.1 software on a Pentium system. Analysis is carried to find the Mean, Standard Deviation, Range, t-tests, ANOVA, Correlation, and Regression. The variables taken for the analysis are:

(i) Process variable, KG; (ii) antecedents viz., Competing, Deciding, Learning and Connecting; (iii) Outcome variables, viz., Efficacy, Satisfaction and Involvement; (iv) Demographic variables, viz., Age, experience, manager level. The results are presented and discussed in the following paragraphs.

### 5.1 Descriptive Statistics

A summary of mean, standard deviation, minimum and maximum value scores of descriptive statistics for  $N = 87$  are given at Table – 2 below:

*Table 2: Mean, Standard Deviation, Minimum and Maximum scores of  $N=87$ .*

Variable	Mean	S. D.	Min	Max
<b>antecedents</b>				
Competing	3.70	.80	1.33	5.00
Deciding	3.25	.70	1.33	5.00
Learning	3.65	.62	1.67	5.00
Connecting	1.18	.39	1.00	2.00
<b>Process variables</b>				
KG	3.63	.56	1.75	5.00
<b>Outcome dimensions</b>				
Efficacy	3.04	.74	1.33	5.00
Satisfaction	3.36	.75	2.00	5.00
Involvement	3.57	.66	2.00	4.67
Outcome	3.32	.58	2.11	4.78

In the antecedents category, the mean value of Competing (3.70) is highest, and Connecting (1.18) is least. In the outcome dimensions category, Involvement (I) indicates a maximum mean value of 3.57 and Efficacy (E) has least mean value of 3.04. The overall mean value of the outcome is 3.32 and is less than the mean value Knowledge Generation (3.63). This indicates that more than 90% of the knowledge generated is contributed toward Outcome or organizational goals by the employees in this high performance organization.

### 5.2 Correlation Analysis

Correlation analysis is carried out to find the correlation coefficient values among the variables of Competing (Com), Connecting (Con), Deciding (Dec), Leading (Lea), Efficacy (E), Satisfaction (S), Involvement (I), Outcome (OC), and Knowledge Generation (KG). The correlation coefficient values are tabulated in the below table – 3.

*Table – 3: Correlation Coefficient values*

	KG	OC	E	S	I	Com	Con	Dec
OC	.4340							
E	.4583	.7912						
S	.2264	.8813	.5719					
I	.3748	.7514	.3195	.5489				
Com	.8010	.3267	.4756	.1253	.1876			
Con	.8068	.3646	.3761	.2409	.2674	.5077		
Dec	.8229	.3431	.3101	.1278	.4127	.5204	.5461	
Lea	.8171	.3793	.2952	.2505	.3856	.4877	.5650	.6593

The correlation analysis indicates that the Knowledge Generation (KG) has high coefficients with Competing (Com), Connecting (Con), Deciding (Dec), Learning (Lea). And Outcome (OC) has high correlation coefficient with Efficacy (E), Satisfaction (S), Involvement (I). Therefore, in the both hypothesis, the null hypothesis can be rejected and alternate hypothesis can be accepted. Therefore, these high value of correlation coefficients indicates the following:

? *There is significant positive correlation relationship between process variables (KG) and its antecedents.*

? *H21: There is a significant positive correlation relationship between overall Outcome (OC) and its dimensions.*

### 5.3 Regression Analysis

Regression analysis is carried out on Knowledge Generation as independent variable and Outcome as dependent variable. The details are as given table -4 below:

Table – 4: Regression mode

Variable	B	SE B	Beta	T	Sig T
OC	.414285	.093287	.433967	4.441	.0000
(Constant)	2.250248	.314553		7.154	.0000
The regression equation is: $KG = 2.25 + 0.414 * OC$					

*This regression model confirms the research question, and indicates that there is a linear relationship between Knowledge Generation and Outcome dimensions.*

## 6.0 CONCLUSIONS

Knowledge Generation in any organization is a human process that needs a strong mind set on the people for knowledge generation as automatic instantaneous process that can be contributed to success organizations. This

needs top management support, enabling environment for all levels of employees to contribute their maximum knowledge for the success of the organization. The authors made some efforts to develop a process model with four antecedents and three outcome variables, developed an instrument for the measurement, and presented the results on descriptive statistics, correlations and liner regression model. Of course, these results have to be verified with large sample space in different organizations. These studies can further lead into competitive advantage, by facilitating right knowledge to right people at right time at all levels of the employees. The continuous improvement and addition of value in these areas can further lead into long term competitive advantage also. As there is a lot scope for research, the authors are interested to continue this study.

## 7.0 LIMITATIONS

Firstly, the sample size is small due to limitations in data collection in the process and availability of the managers at all levels in the selected organization. Secondly, the data collected only from a high performance organization of a public sector undertaking. Thirdly, the antecedents and outcome dimensions are very few to measure the complex variable of knowledge generation. Finally, though the high reliability value of measuring instrument is very encouraging to attempt for the

measurement, some more efforts are essential to improve the questionnaire when it is required to reduce the above three limitations.

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